

REMARKS

Claims 1-5, 38 and 42-49 are pending in the instant application. By this communication, Applicants have amended claims 1 and 49 to further clarifying the invention. The Amendment is fully supported by the specification, and does not introduce new matter or require a new search.

Notwithstanding the foregoing, Applicants expressly reserve the right to prosecute subject matter no longer or not yet claimed in one or more applications that may claim priority hereto. Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the following comments.

Non-Art Related Remarks

35 U.S.C. §112, Second Paragraph

The Examiner has rejected claims 1-5, 38, and 42-49 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In particular, the Examiner has pointed out the following typographical errors in claim 1: "M" is utilized in place of "m" in line 5, and the phrase "Hp is" was not completed in the final two lines. Applicants gratefully acknowledge the Examiner's efforts in pointing out these typographical errors, and have amended the claim to correct the errors, rendering the rejection moot.

With respect to the rejection to claim 49, the Examiner has pointed out that the claimed compounds are not necessarily within the scope of the compounds of claim 1, from which claim 49 depends. Applicants have amended claim 49 accordingly. As amended, the polyamides of claim 49 comprise from 3 to 6 carboxamide residues on each side of a γ -aminobutyric acid or 2,4

diaminobutyric acid linkage. Each carboxamide of the polyamide is N-methylpyrrole, N-methylimidazole, or N-methyl-3-hydroxypyrrole. Applicants respectfully submit that the foregoing amendment renders the rejection moot.

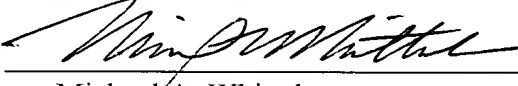
CONCLUSION

Applicants believe that the present application is now in condition for allowance. Favorable consideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

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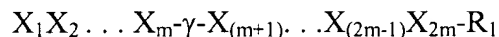
Respectfully submitted,

By


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Appendix A: Marked-up claims, indicating the amendments.

1. (Three times amended) A method for designing a specific polyamide



wherein

X_1 , X_2 , X_m , $X_{(m+1)}$, $X_{(2m-1)}$, and X_{2m} are carboxamide residues forming carboxamide binding pairs

$\frac{X_1}{X_{2m}}, \frac{X_2}{X_{(2m-1)}}, \frac{X_m}{X_{(m+1)}} [\frac{X_1}{X_{2m}}, \frac{X_2}{X_{(2m-1)}}, \frac{X_m}{X_{(m+1)}}]$,

γ is γ -aminobutyric acid or 2,4 diaminobutyric acid, and

R_1 is $-\text{NH}(\text{CH}_2)_{0-100}\text{NR}_2\text{R}_3$, $-\text{NH}(\text{CH}_2)_{0-12}\text{CONH}(\text{CH}_2)_{0-100}\text{NR}_2\text{R}_3$, or $-\text{NHR}_2$, where R_2 and R_3 are independently selected from the group consisting of H, Cl, NO, N-acetyl, benzyl, C_{1-100} alkyl, C_{1-100} alkylamine, C_{1-100} alkyldiamine, C_{1-100} alkylcarboxylate, C_{1-100} alkenyl, a C_{1-100} alkynyl, and C_{1-100} alkyl-L, where L is selected from the group consisting of arylboronic acids, biotins, polyhistidines comprised from about 2 to 8 amino acids, haptens, solid phase supports, oligodeoxynucleotides, N-ethylnitrosourea, fluorescein, bromoacetamide, iodoacetamide, DL- α -lipoic acid, acridine, captothesin, pyrene, mitomycin, texas red, anthracene, anthrinilic acid, avidin, DAPI, and oligodeoxynucleotide, isosulfan blue, malachite green, psoralen, ethyl red, 4-(psoraen-8-yloxy)-butyrate, tartaric acid, and (+)- α -tocopheral, suitable for use as a DNA-binding ligand that is selective for identified target DNA-sequences 5'- $\text{WN}_1\text{N}_2 \dots \text{N}_m\text{W}$ -3' where m is an integer having a value from 3 to 6, the method comprising:

(a) identifying a target sequence of double stranded DNA having the form 5'- $\text{WN}_1\text{N}_2 \dots \text{N}_m\text{W}$ -3', $\text{N}_1\text{N}_2 \dots \text{N}_m$ being the sequence to be bound by carboxamide residues, wherein

each N is independently chosen from the group A, G, C, and T, each W is independently chosen from the group A and T, and m is an integer having a value from 3 to 6;

(b) representing the identified sequence as 5'-Wab ... xW-3', wherein *a* is a first nucleotide to be bound by the X₁ carboxamide residue, *b* is a second nucleotide to be bound by the X₂ carboxamide residue, and *x* is the corresponding nucleotide to be bound by the X_m carboxamide residue;

(c) defining *a* as A, G, C, or T to correspond to the first nucleotide to be bound by a carboxamide residue in the identified sequence;

(d) selecting Im as the X₁ carboxamide residue and Py as the X_{2m} carboxamide residue if *a* = G;

(e) selecting Py as the X₁ carboxamide residue and Im as the X_{2m} carboxamide residue if *a* = C;

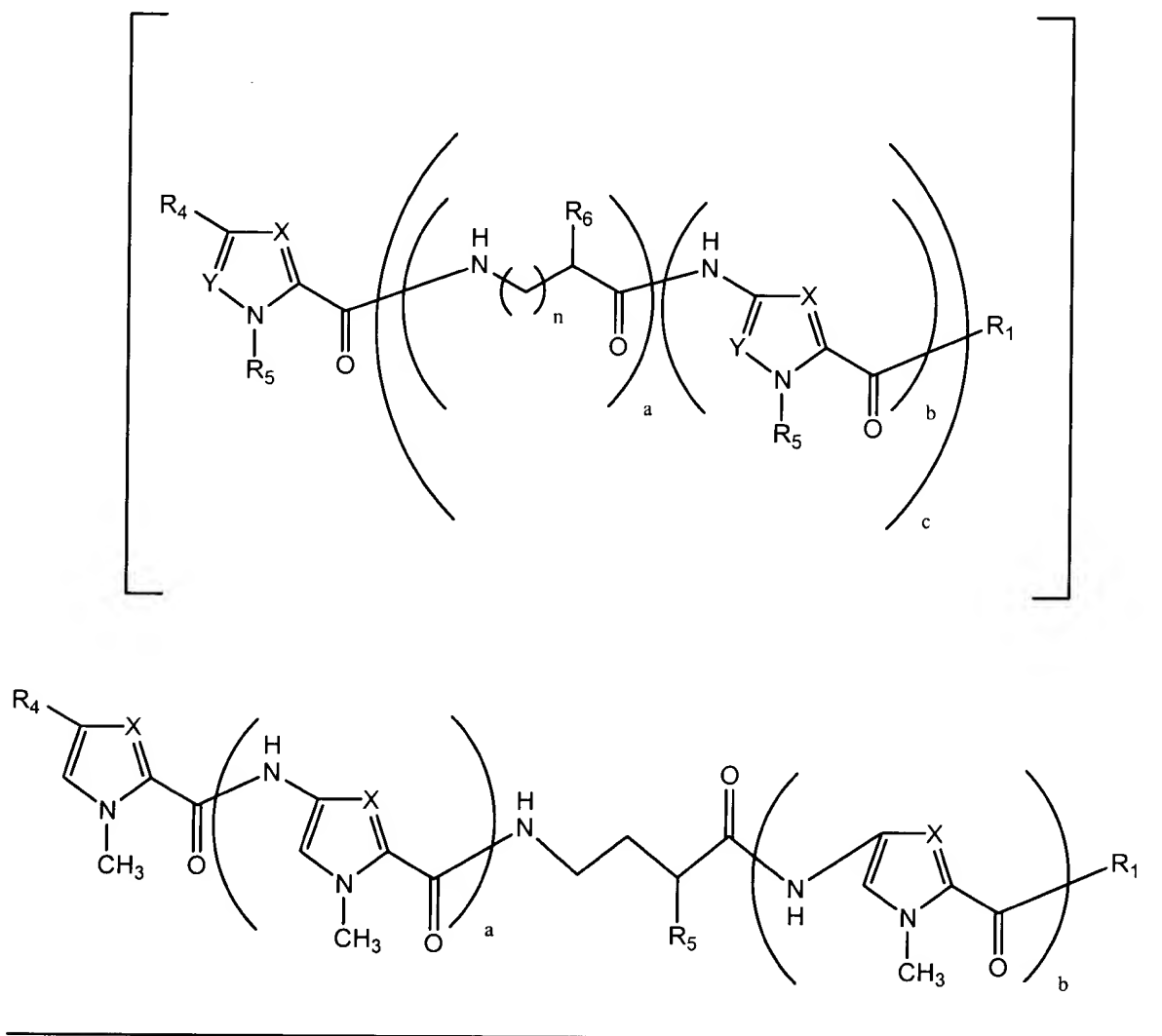
(f) selecting Hp as the X₁ carboxamide residue and Py as the X_{2m} carboxamide residue if *a* = T;

(g) selecting Py as the X₁ carboxamide residue and Hp as the X_{2m} carboxamide residue if *a* = A; and

(h) repeating steps c – g for *b* through *x* until all carboxamide residues are selected;

wherein Im is N-methylimidazole, Hp is 3-hydroxy-N-methylpyrrole, Py is N-methylpyrrole, A is adenine, G is guanine, C is cytosine, and T is thymine.

49. (Twice Amended) A polyamide designed by the method of claim 1, having the structure:



wherein

R₄ is selected from the group consisting of H, NH₂, SH, Cl, Br, F, N-acetyl, and N-formyl;

[each R₅ is independently selected from the group consisting of H, (CH₂)₀₋₆CH₃, (CH₂)₀₋₆NH₂, (CH₂)₀₋₆SH, (CH₂)₀₋₆OH, (CH₂)₀₋₆N(R₇)₂, (CH₂)₀₋₆OR₇, and (CH₂)₀₋₆SR₇, wherein R₇ is (CH₂)₀₋₆CH₃, (CH₂)₀₋₆NH₂, (CH₂)₀₋₆SH, or (CH₂)₀₋₆OH;]

[each R_6] R_5 is [independently selected from the group consisting of] H[,] or NH_2 [, OH, SH, Br, Cl, F, OMe, CH_2OH , CH_2SH , and CH_2NH_2];

R_1 is $-NH(CH_2)_{0-100}NR_2R_3$, $-NH(CH_2)_{0-12}CONH(CH_2)_{0-100}NR_2R_3$, or $-NHR_2$, where R_2 and R_3 are independently selected from the group consisting of H, Cl, NO, N-acetyl, benzyl, C_{1-100} alkyl, C_{1-100} alkylamine, C_{1-100} alkyldiamine, C_{1-100} alkylcarboxylate, C_{1-100} alkenyl, a C_{1-100} alkynyl, and C_{1-100} alkyl-L, where L is selected from the group consisting of arylboronic acids, biotins, polyhistidines comprised from about 2 to 8 amino acids, haptens, solid phase supports, oligodeoxynucleotides, N-ethylnitrosourea, fluorescein, bromoacetamide, iodoacetamide, DL- α -lipoic acid, acridine, captothesin, pyrene, mitomycin, texas red, anthracene, anthrinilic acid, avidin, DAPI, and oligodeoxynucleotide, isosulfan blue, malachite green, psoralen, ethyl red, 4-(psoraen-8-yloxy)-butyrate, tartaric acid, and (+)- α -tocopheral;

each X [and Y are] is independently selected from the group consisting of N, CH, and COH[, CCH₃, CNH₂, CCl, and CF];

~~[each n is an integer from 1 to 2;]~~

each a is an integer from [0 to 1] 2 to 5; and

each b is an integer from [1 to 5] 3 to 6~~;~~ and

c is an integer value from 2 to 10].